Digital Photo Metadata Standard

Version 1.0

A Conceptual Model

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Standard sponsors:

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I. Digital Photo Metadata Standards and Review Team

On April 13, 2006 an *ad hoc* group of National Park Service staff was convened consisting of representatives from different NPS digital imaging and metadata management initiatives. This group was called the Digital Photo Metadata Standards and Review Team (DPMSRT) and was charged with developing a comprehensive metadata standard that NPS staff could use for describing digital camera images.

The DPMSRT released its first draft of the standard for Service-wide comment on May 11, 2006. Based on staff feedback, two more revisions were circulated in July and August. The current version represents the final draft of the document.

Below is a list of the participants on the DPMSRT. They represent a broad range of park and regional office staff, cultural and natural resources programs staff and the Office of the Chief Information Officer.

- Margaret Beer – Inventory and Monitoring Program
- Peter Budde – Project sponsor and NR-GIS Data Store
- Carl Chitwood – Web Content Management System
- Carol Cross – Rocky Mountain National Park
- Vel Decker – Cape Cod National Seashore
- Chris Dietrich - NR-GIS Data Store, CSU project leader
- Joe Gregson – Project sponsor and GIS Program
- Larry Jessen – Rock Creek Park and National Capital Regional Office
- Alice Newton – ANCS+ Museum Management Program
- Dennis Nagao – NPS - Denver Service Center - Transportation Division, Section Chief
- Helen Price – Project sponsor and NPS Focus Digital Library & Research Station
- Theresa Voellinger – Harpers Ferry Center Photographic Conservator
- Jannette Wesley – Denver Service Center, E-TIC
- Kendra Peel – Certified Project Manager
- Kass Evans – project staff / coordinator

II. Introduction

A. <u>Guiding principles for using the standard</u>

- The standard applies to pictorial digital images that are either born digital or created by scanning. It does not apply to digital images of drawings, maps, or texts, or to satellite images.

- The standard identifies the full scope of metadata elements that a project in the NPS might use to describe, manage and preserve digital images. A specific project will select and implement a subset of the elements that will fulfill its requirements.

- The standard identifies which elements are:

  - o **Mandatory** – this element should always be completed
  - o **Mandatory if applicable** – this element should be completed if it applies to the image and the information is readily available
  - o **Optional** – this element may be completed if the end user chooses

- An imaging initiative that chooses to comply with this standard should include all "Mandatory" elements in every record. Compliance with the standard is voluntary. There is no plan to require any NPS imaging initiative to comply with this standard.

- Metadata has been grouped into four categories that are typical for metadata systems.

  - o **Administrative metadata** – those elements used to manage the image or the record such as record number, the date the record was created or revised, record security, and/or copyright info

  - o **Descriptive metadata** – those elements used to describe the creation of and content of the image such as title, photographer, subject

  - o **Technical metadata** – those elements used to describe the technical specs of the digital image such as file size and format, resolution, pixel width and height

  - o **Local extension metadata** – elements that have been defined for a particular NPS local project and are not universally applicable across all NPS projects.

- The standard stands independent of any technology that may be used to manage and serve images and metadata. It is assumed that the metadata will probably be kept in an information system, local database or spreadsheet, or in meta tags in a Web page.

- In determining the appropriateness of any particular metadata element, NPS staff are encouraged to be mindful that the ultimate result of the metadata record is to preserve America's information heritage, i.e. the image, for generations to come.

<u>B. The Seven Mandatory Elements</u>

The Digital Photo Metadata Standard specifies that seven metadata elements should be considered mandatory.

It was determined that these are the minimum number of elements required to enable an NPS project to access, interpret and manage an image.

- The first three elements describe who or what is in the image and where and when it was taken.

- The Alpha Code is probably the single most useful element in the NPS for identification and for linking records in different computer systems.

- The final three are necessary in order to comply with federal laws and NPS policies including issues such as copyright, privacy, sensitive information, and security.

1. **Title** - who or what is in the image

2. **Image_Content_Place** – where the image was taken

3. **Image_or_Set_Create_Date** – when the image was taken

4. **NPS_Unit_Alpha_Code** – (e.g. Park code) used for managing or filtering groups of records and/or for linking systems

5. **Metadata_Access_Constraints** – who may view the record/image (e.g. public, staff only)

6. **Constraints_Information** – explanation of restrictions, if any, on access/use of the image or the metadata

7. **Contact_Information => Contact Organization** – who to contact for further information

Although these elements are considered Mandatory, it is understood that they may not always apply. For example, some images, such as those created for national programs, will not have an NPS_Unit_Alpha_Code. Constraints_Information provides a place to describe any and all restrictions ranging from copyright to security. However, if there are no restrictions on access to or use of an image, then the Constraints_Information element may be blank.

Staff should take a pragmatic approach to completing mandatory metadata elements. If it applies, use it. If it does not apply, move on to the next one.

III. Digital Photo Metadata Standard – Summary View

Below is a summary or bird's-eye view of the all of the metadata elements in the standard. When an element is indented, it means it is a subelement (child element) of the metadata element above it. The Detailed View with definitions follows below.

♦ Red text (M) = mandatory (required for every image metadata record)

♦ Blue text (MA) = mandatory if applicable (required if information is available)

♦ Black text = optional (metadata creator chooses to use or not use element)

♦ Teal text (MA) = if the optional parent element is used, then this child element is mandatory

♦ (c) = compound; a container metadata element that serves to create a cluster of subelements, but does not have its own data

♦ (R) = Repeatable; if placed next to a compound element, the whole cluster is repeatable

```
NPS_Digital_Photograph_Information (c)
        Administrative_Information (c) (O)
                Master_Metadata_ID
                Related_Identifier (c) (R)
                        Related_ID_Name (MA)
                        Related_ID_Value (MA)
                Contact_Information (c) (MA) (R)
                        Contact_Name (c) (MA)
                                Contact_Person
                                Contact_Organization (M)
                        Contact_Role (R)
                        Contact_Position
                        Contact_Address (c) (R)
                                Address_Type
                                Address (MA)
                                City (MA)
                                State_or_Province (MA)
                                Postal_Code (MA)
                                Country
                        Contact_Voice_Telephone (R)
                        Contact_TDD/TTY_Telephone
                        Contact_Facsimile_Telephone
                        Contact_Electronic_Mail_Address (R)
                        Hours_of_Service
                        Contact_Instructions (R)
                Metadata_Create_Date
                Metadata_Update_Date (R)
                Metadata_Access_Constraints (M) (R)
                Metadata_Use_Constraints (R)
                Image_Access_Constraints (R)
                Image_Use_Contraints (R)
```

Constraints_Information (c) (M)
Copyright_Information (c)
    Copyright_Date
    Copyright_Holder
    Copyright_Description
Retention_Information (c)
    Retention_Period (MA)
    Retention_Description (MA)
Descriptive_Information (c) (M)
    Title (M)
    Alternate_Title (R)
    Contributor (c) (R)
        Name_Information (MA)
        Role
        Affiliation
    Information_Type
    Image_or_Set_Create_Date (M)
    Image_or_Set_Update_Date (R)
    Publication_Date
    Publisher
    Size_and_Format
    Online_Linkage
    Abstract (R)
    Controlled_Terms (c) (R)
        Controlled_Term_Thesaurus (MA)
        Controlled_Term (MA)
    Uncontrolled_Term (c) (R)
    Image_Content_Date (c) (R)
        Begin_Date (MA)
        End_Date
    Image_Content_Place (c) (M, R)
        Place_Description (M)
        Bounding_Coordinates(c)
            West
            East (MA)
            North (MA)
            South
            Datum (MA)
        UTM_Bounding_Coordinates (c)
            UTM_West
            UTM_East (MA)
            UTM_North (MA)
            UTM_South
            UTMZone (MA)
            UTMDatum
    Comments (R)
    Internal_Comments (R)
    Image_Provenance
    Intended_Audience
    NPS_Unit_Information (c) (MA) (R)
        NPS_Unit_Alpha_Code (MA)
        NPS_Unit_Name
        NPS_Unit_Type
        NPS_Organization_Code
        NPS_Unit_Previous_Code
        NPS_Unit_Previous_Name
        NPS_Parent_Unit_Code

NPS_Parent_Unit_Name
Source_Information (c) (R)
    Source_Description
    Source__Physical_Location
    Source_Digital_Location
Related_Collection (c) (R)
    Citation_Information (c)
        Title (MA)
        Contributor (c) (R)
            Name_Information
            Role
            Affiliation
        Information_Type
        Publication_Date
        Publisher
        Other_Citation_Details (R)
        Online_Linkage (R)
        Related_Collection (c) (R)
            Citation_Information (c)
                Title
                Contributor (c) (R)
                    Name_Information
                    Role
                    Affiliation
                Information_Type
                Publication_Date
                Publisher
                Other_Citation_Details (R)
                Online_Linkage
                Related_Collection (c)
                    Citation_Information *(repeat cluster)*
                Related_Identifier (c) (R)
                    Related_ID_Name
                    Related_ID_Value
        Related_Identifier (c) (R)
            Related_ID_Name
            Related_ID_Value
Related_Resource (c) (R)
    Citation_Information (c)
        Title (MA)
        Contributor (c) (R)
            Name_Information
            Role
            Affiliation
        Information_Type
        Publication_Date
        Publisher
        Other_Citation_Details
        Online_Linkage
        Related_Collection (c)
            Citation_Information (c)
                Title
                Contributor (c) (R)
                    Name_Information
                    Role
                    Affiliation

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```
                                        Information_Type
                                        Publication_Date
                                        Publisher
                                         Other_Citation_Details
                                         Online_Linkage
                                        Related_Collection (c)
                                                Citation_Information  (repeat cluster)
                                        Related_Identifier (c)
                                                Related_ID_Name
                                                Related_ID_Value
                        Related_Identifier (c)
                                Related_ID_Name
                                Related_ID_Value
                Related_System (c) (R)
                        Related_System_Name (MA)
                        Related_System_Short_Name
                        Related_System_Identifier
                        Related_System_Link
                        Related_System_Description
                        Related_Contact (c)
                                Contact_Information (c)
                                        Contact_Name (c) (MA)
                                                Contact_Person
                                                Contact_Organization (MA)
                                        Contact_Role (R)
                                        Contact_Position
                                        Contact_Address (c)
                                                Address_Type
                                                Address (MA)
                                                City (MA)
                                                State_or_Province (MA)
                                                Postal_Code (MA)
                                                Country
                                        Contact_Voice_Telephone
                                        Contact_TDD/TTY_Telephone
                                        Contact_Facsimile_Telephone
                                        Contact_Electronic_Mail_Address
                                        Hours_of_Service
                                        Contact_Instructions
                Coded_Metadata (c) (R)
                        Coded_Metadata_Source
                        Coded_Metadata_Content
Technical_Information (c)
        Image_Information (c) (R)
                Image_Caption
                Image_Description
                Multiple_Image_Reference_Name_or_Part_Number
                Primary_Image_Technical_Information (c)
                        Image_Data (c)
                                File_Name (MA)
                                File_Location
                                File_Type
                                File_Size
                                Compression
                                Image_Width
                                Image_Height
```

Resolution_Unit
X_Resolution
Y_Resolution
Bitdepth
Colorspace
Digital_Capture_Technical_Information (c)
Manufacturer
Model
Software
Date_Time_of_Original
Date_Time_Digitized
FNumber
Exposure_Time
Exposure_Bias
Subject_Distance
Metering_Mode
ISO_Speed
Focal_Length
Flash
Orientation
Compressed_Bits_per_Pixel
Shutter_Speed
Aperture_Value
EXIF_Version
GPS_Capture (c)
GPS_Version_ID
GPS_Longitude
GPS_Latitude
GPS_Altitude
GPS_Destination_Longitude
GPS_Destination_Latitude
GPS_Destination_Bearing
GPS_Destination_Distance
GPS_Map_Datum
GPS_Image_Direction
GPS_Date_Stamp
GPS_Time_Stamp
GPS_UTM_East
GPS_UTM_North
GPS_UTMZone
GPS_DOP
GPS_Fix_Type
Modified_Image_Technical_Information (c)
Image_Data (c)
File_Name
File_Location
File_Type
File_Size
Compression
Image_Width
Image_Height
Resolution_Unit
X_Resolution
Y_Resolution
Bitdepth
Colorspace

Thumbnail_Information (c)
    Image_Data (c)
        Thumbnail_File_Name
        Thumbnail_File_Type
        Thumbnail_File_Description
    Change_History (c) (R)
        Date_Processed
        Processing_Agency
        Processing_Rationale
        Processing_Actions
        Processing_Software
Local_Extension_Information
    Local_Profile_Name
    NPS Focus Digital Library *[sample of Local_Profile_Name that has been completed]*
        RecordOwner
        MrSID
            Server
            Catalog
            Folder
            File

IV. Digital Photo Metadata Standard - Detailed View

♦ **(c)** = compound; a container metadata element that serves to create a cluster of subelements, but does not have its own data

♦ **M, MA, MO, O** = Mandatory, Mandatory if applicable, Mandatory if optional parent element is used, or Optional

♦ **NR/R** = Not Repeatable or Repeatable

♦ **Colored sections** = A cluster of parent/child elements that are intended to be kept together

Administrative Information

Element Name	M/O	Rep	Definition
Master_Metadata_ID	O	NR	This identifier serves as the primary key (e.g. record number) that may be assigned to the metadata record to uniquely identify it among several systems. A globally unique identifier is often referred to as a GUID. Use this element ONLY if the record number is formatted as a GUID. Use Related_Identifier for other types of locally or system generated record numbers
Related_Identifier (c)	O	R	Administrative numbers associated with the record and/or the digital photo(s) described by the record including locally assigned or system supplied record numbers; accession numbers, job numbers, etc. Consists of two parts: a textual description of what type of number it is and the number itself. For numbers associated with other systems or projects, see Related_System under Descriptive_Information below.
=> **Related_ID_Name**	MO	NR	A textual description of the number such as who or what created the numbering system, e.g. NPS Focus record number, ANCS+ accession number, HFC job number.
=> **Related_ID_Value**	MO	NR	The administrative number described in Related_ID_Name such as the actual record, accession, or job number.
Contact_Information (c)	M	R	Every image and record should have at least one person or organization who can be contacted for further information about the image and/or metadata record. The minimum required metadata is a child element for Contact_Organization with the organization being the responsible park or program office. If there are multiple types of contacts, repeat the whole Contact_Information cluster and be sure to use

			the Contact_Role element to explain the responsibility of the contact provided.
=> **Contact_Name** (c)	M	NR	Contact_Information to indicate the identity of, and means to communicate with, person(s) and organization(s) associated with the digital photo.
=> => **Contact_Person**	O	NR	Contact_Person to indicate the name of the individual to which the contact type applies.
=> => **Contact_Organization**	M	NR	Contact_Organization to indicate the name of the organization to which the contact type applies.
=> **Contact_Role**	O	R	Describes the reasons or conditions for which someone can contact this person/organization. Select from the following list of controlled terms. If "Other" is selected, provide an explanation in the Contact_Instructions element. General contact Image Data Steward Image Contact Metadata Steward Metadata Creator Metadata Updater FOIA Officer Other
=> **Contact_Position**	O	NR	Contact_Position indicates the title of contact person, if available.
=> **Contact_Address** (c)	O	R	Contact_Address to indicate the address for the contact organization or individual.
=> => **Address Type**	O	NR	Address_Type to indicate the information provided by the address, usually mailing, physical, or mailing and physical.
=> => **Address**	MO	NR	Address to indicate an address line for the address, usually street address, office and/or building numbers.
=> => **City**	MO	NR	City to indicate the city of the address.
=> => **State_or_Province**	MO	NR	State_or_Province to indicate the state or province of the address.
=> => **Postal_Code**	MO	NR	to indicate the zip code or postal code of the address.
=> => **Country**	O	NR	Country to indicate the country of the address.
=> **Contact_Voice_Telephone**	O	R	Contact_Voice_Telephone to indicate the telephone number by which individuals can speak to the organization or individual.
=> **Contact_TDD/TTY_Telephone**	O	NR	Contact_TDD/TTY_Telephone to indicate the telephone number by which hearing-impaired individuals can contact the organization or individual.

=> **Contact_Facsimile_Telephone**	O	NR	Contact_Facsimile_Telephone to indicate the telephone number of a facsimile machine of the organization or individual.
=> **Contact_Electronic_Mail_Address**	O	R	Contact_Electronic_Mail_Address to indicate the address of the electronic mailbox of the organization or individual.
=> **Hours_of_Service**	O	NR	Hours_of_Service to indicate time period when individuals can speak to the organization or individual.
=> **Contact_Instructions**	O	R	Contact_Instructions to indicate supplemental instructions on how or when to contact the individual or organization.
Metadata_Create_Date	O	NR	The date when the metadata record was created.
Metadata_Update_Date	O	R	The date and possibly time that the metadata record was last updated or edited.
Metadata_Access_Constraints	M	R	Restrictions and legal prerequisites for accessing the image metadata. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the metadata. At the minimum, this element specifies if the record should be public access, staff only access, or some other option.
Metadata_Use_Constraints	O	R	Restrictions on use of the image metadata after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the metadata.
Image_Access_Constraints	O	R	Restrictions and legal prerequisites for accessing the image product(s). These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the image product(s).
Image_Use_Contraints	O	R	Restrictions on use of the image after access is granted. These include any use constraints applied to ensure the protection of privacy or intellectual property, and any special restrictions or limitations on using the image.
Constraints_Information	MA	NR	Description of any restrictions placed on access to or use of the image or metadata record. These may include, but are not limited to, restrictions to comply with laws or policy related to copyright, privacy, sensitivity, or security.
Copyright_Information (c)	O	NR	Describes if the digital photo(s) are in the public domain or may be copyrighted. At the minimum, the Copyright_Description child element must provide this information. If it is known that the digital photo(s) are or might be copyrighted,

			further information must be provided. Note that a digital photo taken by NPS staff on NPS time will always be in the public domain. The status of a digital photo taken by a contractor will always depend upon the wording of the contract.
=> **Copyright_Date**	O	NR	The copyright date of the digital photo(s) if some person or agency outside of the federal government holds the copyright. Note: the federal government can not copyright work.
=> **Copyright_Holder**	O	NR	The name of the copyright holder if this can be determined with absolute certainty. A signed affidavit should be obtained from the copyright holder, when there is no other unambiguous documentation. Note, no branch of the federal government, or employee who has produced a digital photo on work time, may be a copyright holder.
=> **Copyright_Description**	M	NR	Indicates if the digital photo is in the public domain, is definitely copyrighted, or might be copyrighted. If other than public domain, provide additional information. Do not include here, information that may impact the privacy of the copyright holder such as their home address.
Retention_Information (c)	O	NR	Information about how long the digital photo and metadata record should be retained.
=> **Retention_Period**	MO	NR	The amount of time the digital photo(s) and metadata should be retained. The choices usually are "permanent" or a specified number of years or months.
=> **Retention_Description**	MO	NR	Reason for retention period which may be official records management practices, or other practical considerations such as a low quality image that is being replaced with a better one.

Descriptive Information

Element Name	M/O	Rep	Definition
Title	M	NR	A very descriptive title or caption identifying the content of the image or image set. At a minimum, the title should describe who or what is in the image; the "what" may be an activity or event (e.g. Hikers on Randolf Trail).
Alternate_Title	O	R	The Alternate Title element is used when the content of the image can be decribed in multiple ways. For example, many Civil War monuments are known by different names. The Title element can use one and an Alternative Title may be added to for the other. The purpose of the Alternate Title is to ensure that users who know of and search by the alternate name, will still be able to access the record.
Contributor (c)	O	R	Includes the name of any person or organization that was responsible for causing the image to exist in its current form. This could be a photographer, scanning technician, photo editor, or project sponsor, etc. Use the Subject or Keywords element for the name of a person who appears in an image, but was not responsible for its creation or modification.
=> Name_Information	MO	NR	The name of a person or organization responsible for causing the image to exist in its current form. Personal names should be entered in the order: LastName, FirstName Middle Initial, then Jr. if any. Do not add rank or title, such as Dr., Superintendent, M.S., Ph.D., but these may be noted in the Affiliation element. Enter park names directly (with no previous U.S., D.O.I. or NPS). Enter the words "National Park Service," before all other NPS program, office names.
=> Role	O	NR	The role this personal played in causing the image to be created in its current form. Some possible choices include: Photographer, Scanning Technician, Photo Editor, Sponsor.
=> Affiliation	O	NR	The organizational affiliation (and title if desired, e.g. Fire Specialist) associated with the Name element. This may include any office within a park or the NPS in general, or an outside affiliation such as a contractor's company, university affiliation, Friends group, or any private or government organization.
Information_Type	O	R	Identifies type of information described in this metadata record. For digital photos, this will always be "Image" or "Image collection" if the record describes a large remote group of images. Note, since many information systems or Web

			spaces have more than one information type (e.g. images, reports, drawings, maps, data sets), the Information_Type element will enable discovery of images by type.
Image_or_Set_Create_Date	M	NR	The date when the image or photograph was originally created in either film or "born digital" format.
Image_or_Set_Update_Date	O	R	The date when the digital photo was last modified by scanning, image editing, format change, etc.
Publication_Date	O	NR	The date when the image or photograph was published, usually to a Web-enabled information system or Web page. Digital photos stored on a disk or hard drive are not considered to be published.
Publisher	O	NR	The name of the individual or organization that published the image or image set. This will usually be the National Park Service, with or without the name of a division of the NPS.
Size_and_Format	O	NR	The Size and Format element describes the quantity, digital format, and file size, if desired, of the resource(s) described on the record. For example, 3 digital images in JPG format (1-1.5 MB).
Online_Linkage	O	R	A link to the resource being described. Entries should follow the Uniform Resource Locator convention of the Internet.
Abstract	O	R	Abstract or summary description about the content of or significance of the image or image set. Identify people, places, buildings, things, and events if this is not clear from the Title element.
Controlled_Terms (c)	O	R	Word or phrases taken from a thesaurus/controlled vocabulary list that provide topics or themes of the image or image set in order to facilitate discovery (searching) of the image. Controlled terms may be topics, proper names of persons, groups or events, or visual descriptions of content (e.g. shaking hands, smiling faces).
=> **Controlled_Term_Thesaurus**	MO	NR	The name of the thesaurus from which the Controlled_Term was taken.
=> **Controlled_Term**	MO	NR	The topical word or phrase taken from a thesaurus or other controlled list. Repeat the Controlled_Terms cluster for each new Controlled Term.
Uncontrolled_Terms	O	R	Word or phrases that are composed by the metadata creator and NOT taken from a thesaurus/controlled vocabulary list that provide topics or themes of the image or image set in

			order to facilitate discovery (searching) of the image. Keywords may be topics, proper names of persons, groups or events, or visual descriptions of content (e.g. shaking hands, smiling faces).
Image_Content_Date (c)	O	R	The single date or date range represented by the contents of the digital photo(s).
=> Begin_Date	MA	NR	A single date OR the beginning of a date range represented by the contents of the digital photo(s).
=> End_Date	O	NR	The end date of a date range represented by the contents of the digital photo(s).
Image_Content_Place (c)	M	R	The geographical location where the picture was taken. May include a text description (State, county, city, park, region in park), bounding or Lat/Long coordinates, and/or UTM coordinates.
=> Place_Description	M	NR	A text description of the geographical location where the picture was taken. May include State, county, city, park, region in park.
=> Bounding_Coordinates (c)	O	NR	Coordinates that describe the geographic location or extent of the image. Should be written in decimal degrees.
=> => West	O	NR	West coordinate that describes the geographic location or extent of the image.
=> => East	MO	NR	East coordinate that describes the geographic location or extent of the image. If only Lat/Long coordinates are available, use East and North.
=> => North	MO	NR	North coordinate that describes the geographic location or extent of the image. If only Lat/Long coordinates are available, use East and North.
=> => South	O	NR	South coordinate that describes the geographic location or extent of the image.
=> => Datum	MO	NR	Datum that describes the geographic location or extent of the image, usually NAD83.
=> UTM_Bounding_Coordinates (c)	O	NR	UTM (Universal Transverse Mercator) coordinates, zone and datum that describe the geographic location or extent of the image.
=> => UTM_West	O	NR	UTM west coordinate that describes the geographic location or extent of the image.
=> => UTM_East	MO	NR	UTM east coordinate that describes the geographic location or extent of the image.
=> => UTM_North	MA	NR	UTM north coordinate that describes the geographic location or extent of the image.
=> => UTM_South	O	NR	UTM south coordinate that describes the geographic location or extent of the image.
=> => UTMZone	MO	NR	UTM zone that describes the geographic location

			or extent of the image.
=> => **UTMDatum**	MO	NR	UTM datum that describes the geographic location or extent of the image.
Comments	O	R	A comment, note or description about anything related to the digital photo(s) or the metadata record that is not covered by another element.
Internal_Comments	O	R	Use the Internal Comments element for any type of information that should display to NPS staff but NOT to the public. Examples of Internal Comments for staff only may be the Cost or value of the resource, statement of security issues associated with the resource, the personal name and contact information for a donor or copyright holder that should be kept private.
Image_Provenance	O	R	A history of the origin of the image dating back to its initial creation in digital format or film. The provenance documents how the image came to be in control of the NPS in the current form, especially when it was not taken by an NPS staff member or contractor. Images in their physical or digital form are often received due to partnerships, gifts, purchases, or "on loan" collections. The provenance documents this complex history.
Intended_Audience	O	R	The target audience for whom this digital photo would be most useful.
NPS_Unit_Information (c)	MA	R	Stores NPS unit alpha and numeric organization codes within the context of a unit type.
=> **NPS_Unit_Alpha_Code**	MA	NR	Stores the NPS unit alpha code. Codes for regions, networks, programs, and offices may vary between programs. To promote consistency and interoperability, it is recommended that you consult the official list of NPS codes maintained by the Office of the Chief Information Officer located at https://amoeba.nps.gov/AMOEBA/NPS_ORGANIZATIONCODES.NSF.
=> **NPS_Unit_Name**	O	NR	Stores the NPS unit name
=> **NPS_Unit_Type**	O	NR	Stores the NPS unit type to allow for uniqueness and extensibility of the NPS_Unit_AlphaCode, usually "Park" "Region" "Network" "Program" or "Office."
=> **NPS_Organization_Code**	O	NR	Stores the NPS Organization Code.
=> **NPS_Unit_Previous_Code**	O	NR	Stores the previous NPS Organization Code.
=> **NPS_Unit_Previous_Name**	O	NR	Stores the previous NPS Organization Name.
=> **NPS_Parent_Unit_Code**	O	NR	Stores the NPS Organization code of the parent NPS organization.

=> **NPS_Parent_Unit_Name**	O	NR	Stores the NPS Organization name of the parent NPS organization.
Source_Information (c)	O	R	Section containing information about the original or source photo used to create the current digital photo. This may be physical (e.g. film, slide, photo print) or born digital.
=> **Source_Description**	MO	NR	Physical or technical description of the original or source photo. If the original was physical, give its format and dimensions (e.g. 35mm slide, 8" x 10" black and white photograph, etc.) If the original came from a digital camera, provide a statement to that effect (Image created in JPG format using Nikon 5.1 megapixel digital camera with flash). If it is unknown, provide a statement like Original source and format of image is unknown.
=> **Source__Physical_Location**	O	NR	The physical location of the source photo in its physical form. The information should be complete enough that anyone associated with the particular park or program can find it, but may also be worded in a cryptic manner if there is a security concern if the full location is made public.
=> **Source_Digital_Location**	O	NR	The location of the original digital version of the photo which may be a server or any type of storage unit ranging from CD-ROM to a hard drive. The information should be complete enough that anyone associated with the particular park or program can find it, but may also be worded in a cryptic manner if there is a security concern if the full location is made public.
Related_Collection (c)	O	R	The information identifying a larger work, grouping, series or collection in which the image or image set is included. Many images are part of a collection or other grouping that indicates that a particular set of images belong together because of a common theme (e.g. wildflower images), project (e.g. Facilities Management asset inventory images) and/or responsible organization such as a park or program (e.g. Sequoia and Kings Canyon National Park images).
=> **Citation_Information** (c)	MO	NR	The information identifying another information resource to which this digital photo is related. Other information resources might include reports, maps, drawings, before or after images. For example, the current digital photo may be of a building and related resources may include metadata records for the architectural drawings of the building or a report on the history of a building.

=> => **Title**	MO	NR	The title of the resource which may be a text, image, map, collection name, series, etc.
=> => **Contributor** (c)	O	R	Includes the name of any person or organization that was responsible for the Related title being described.
=> => => **Name_Information**	MO	NR	The name of a person or organization responsible for the Related title.
=> => => **Role**	O	NR	The role this person or organization played in causing the related title to be created in its current form. This could be a photographer, author, editor, musician, sponsor, cartographer, artist, etc.
=> => => **Affiliation**	O	NR	The organizational affiliation (and title if desired, e.g. Fire Specialist) associated with the Name element. This may include any office within a park or the NPS in general, or an outside affiliation such as a contractor's company, university affiliation, Friends group, or any private or government organization.
=> => **Information_Type**	O	NR	The information resource type such as Image, Report, Book, Article, Map, Drawing, Data Set.
=> => **Publication_Date**	O	NR	The date when the digital photograph is published (to the Web) or otherwise made available for release.
=> => **Publisher**	O	NR	The name of the individual or organization that published the information resource being described.
=> => **Other_Citation_Details**	O	R	Other information such as note, comments, or description required to complete the citation.
=> => **Online_Linkage**	O	R	A link to the resource being described. Entries should follow the Uniform Resource Locator convention of the Internet.
=> => **Related_Collection** (c)	O	R	The information identifying a larger work, grouping, series or collection in which this Related_Collection is included.
=> => =>Citation_Information (c) => => => => Title => => => => Contributor (c) => => => => => Name_Information => => => => => Role => => =>=> => Affiliation => => => => Information_Type => => => => Publication_Date => => => => Publisher => => => => Other_Citation_Details => => => => Online_Linkage => => => => Related_Collection (c) => => => => => Citation_Information *(repeat citeinfo cluster)* => => => => Related_Identifier (c) => => => => => Related_ID_Name			

=> => => => => Related_ID_Value			
=> => **Related_Identifier** (c)	O	R	An identifier, such as a project or record number that is associated with the Related item.
=> => => **Related_ID_Name**	MO	NR	The name of the system, project, organization, etc. that has assigned the identifier or number.
=> => => **Related_ID_Value**	MO	NR	The identifier or number that has been assigned.
Related_Resource (c)	O	R	The information identifying another information resource to which this digital photo is related. Other information resources might include reports, maps, drawings, before or after images. For example, the current digital photo may be of a building and a Related_Resource may include metadata records for the architectural drawings of the building or a report on the history of a building.
=>Citation_Information (c) => => Title => => Contributor (c) => => => Name_Information => => => Role => => => Affiliation => => Information_Type => => Publication_Date => => Publisher => => Other_Citation_Details => => Online_Linkage => => Related_Collection (c) => => =>Citation_Information (c) => => => => Title => => => => Contributor (c) => => => => => Name_Information => => => => => Role => => => => => Affiliation => => => => Information_Type => => => => Publication_Date => => => => Publisher => => => => Other_Citation_Details => => => => Online_Linkage => => => => Related_Collection (c) => => => => => Citation_Information *(repeat cluster)* => => => => Related_Identifier (c) => => => => => Related_ID_Name => => => => => Related_ID_Value => => Related_Identifier (c) => => Related_ID_Name => => Related_ID_Value			This section is identical to the Citation_Information section under Related_Collection above.
Related_System (c)	O	R	Information on content in other NPS or non-NPS information systems that have a relationship to the current digital photo/metadata record –OR– are being linked to the current digital photo/metadata record. For example, this element cluster could be used to link a record in NPS Focus with a record in PMIS, eTIC or the NR-GIS Data Store.
=> **Related_System_Name**	MO	NR	The formal name of an information system, such as *Project Management Information System* or *List of Classified Structures.*

=> **Related_System_Short_Name**	O	NR	The short name, usually the acronym, used to describe a system such as PMIS or LCS.
=> **Related_System_Identifier**	MO	NR	An identifier, such as a project or record number, that is used to link the current record to a specific record or group of records in the Related_System.
=> **Related_System_Link**	O	NR	A full URL used to link the current record to a Related_System which may be its home page, a specific record or a group of records.
=> **Related_System_Description**	O	NR	Information on how/why the current record is related to the Related_System which may include a description of the Related_System and/or the purpose for the linkage.
=> **Related_Contact** (c)	O	NR	The contact information for the person or organziation responsible for the Related_System.
=>=>Contact_Information (c) => => => Contact_Person_Primary (c) => => =>=> Contact_Person =>=> => => Contact_Organization => => => Contact_Position => => => Contact_Address (c) => => => => Address_Type => => => => Address => => => => City => => => => State_or_Province => => => => Postal_Code => => => => Country => => => => Contact_Voice_Telephone => => => Contact_TDD/TTY_Telephone => => => Contact_Facsimile_Telephone => => => Contact_Electronic_Mail_Address => => => Hours_of_Service => => => Contact_Instructions			This section is identical to the Contact_Information section above.
=> **Coded_Metadata**	O	R	This provides a holding place for imported metadata that can not be parsed, or, for whatever reason, is not being placed in other elements. This could hold an entire XML file or be a dump of metadata stored inside an image such as IPTC metadata.
=> => **Coded_Metadata_Source**	MO	NR	The name and/or description to identify the system, file or other source of the coded metadata.
=> => **Coded_Metadata_Content**	MO	R	The coded metadata that is imported into the system.

Technical Information

NOTE: The Primary_Image_Technical_Information section contains many sub-clusters of metadata elements. The entire section is colored blue with each subsection being a slightly different shade of blue.

NOTE: If more than one image is being described on a metadata records, the ENTIRE Image_Information cluster is repeated for each image.

Element Name	M/O	Rep	Definition
Image_Information (c)	MA	R	Technical information about the digital photo.
=> **Image_Caption**	O	NR	A text phrase with information describing the overall subject of the image that could be used as a caption for a print or Web publication. Do NOT use this instead of the Title in Descriptive_Information section.
=> **Image_Description**	MA	NR	A description of an individual image for which technical information is provided. Use when two or more different images are associated with a metadata record to describe this particular image, e.g. north side of building, south side of building. ALWAYS complete the Title element in the Descriptive_Information section even if this element is used.
=> **Multiple_Image_Reference_Name_ or_Part_Number**	MA	NR	A unique part number or other key value to identify each image in a set.
=> **Primary_Image_Technical_Information** (c)	MA	NR	The primary image is the source or original image, e.g. the earliest digital version of the image such as the image from the digital camera or the scanner. This primary/original image is usually the one that is archived. It may also be modified for delivery over the Web by changing format (e.g. TIF to JPG; JPG to MrSID), changing size and/or resolution (e.g. from 300 dpi to 96 dpi). This information for this modified version of the primary image is captured below under Modified_Image_Technical_ Information.
=> => **Image_Data** (c)	MA	NR	Detailed technical metadata about an image.
=> => => **File_Name**	MA	NR	The file name of the image including extension.
=> => => **File_Location**	MA	NR	The drive and folder path indicating where the file is stored on a server, or other storage system. This may also be a unique identifier if a storage system uses this instead of folders for storage.
=> => => **File_Type**	O	NR	The file format of the primary (e.g. original or source) file which is usually the copy that gets archived. Commonly used formats for digital photographs are: TIFF, JPEG.
=> => => **File_Size**	O	NR	The size in bytes of the image file. This is not condensed to KB, MB or GB. Example a 7.28MB

			file would be written out as 728,860,431.
=> => => **Compression**	O	NR	The compression scheme used to store the image data. Common schemes used for digital photographs are: Uncompressed, CCIT Group 3 1D, CCITT Group 3 2D, CCITT Group 4, LZW, JPEG Baseline Sequential, JPEG2000 Lossy, JPEG2000 Lossless.
=> => => **Image_Width**	O	NR	The width of the digital image, i.e. horizontal or X dimension, in pixels.
=> => => **Image_Height**	O	NR	The height of the digital image, i.e. horizontal or X dimension, in pixels.
=> => => **Resolution_Unit**	O	NR	Unit of measure used for X and Y resolution, usually inches (e.g. 300 dots per inch).
=> => => **X_Resolution**	O	NR	The number of pixels per ResolutionUnit in the Image_Width direction.
=> => => **Y_Resolution**	O	NR	The number of pixels per ResolutionUnit in the Image_Length direction.
=> => => **Bitdepth**	O	NR	The number of colors possible with each pixel.
=> => => **Colorspace**	O	NR	The color model of the image data. Common models used for digital photographs include: RGB, SRGB, CMYK, YCbCr.
=> => **Digital_Capture_Technical_ Information** (c)	O	NR	Detailed technical metadata about the process used to capture the image by digital camera or scanner.
=> => => **Manufacturer**	O	NR	The manufacturer of the digital camera OR scanner used to create the image, e.g. Nikon, Epson. *Exif 2.2 field name:* Make)
=> => => **Model**	O	NR	The model name of the digital camera OR scanner used to create the image, e.g. E5200. (*Exif 2.2 field name:* Model)
=> => => **Software**	O	NR	Software used for this camera or scanner model. (*Exif 2.2 field name:* Software)
=> => => **Date_Time_of_Original**			The date and time when the original image data was generated. For a digital camera image the date and time the picture was taken are recorded. The format is "YYYY:MM:DD HH:MM:SS" with time shown in 24-hour format, and the date and time separated by one blank character. (*Exif 2.2 field name:* DateTimeOriginal)
=> => => **Date_Time_Digitized**			The date and time when the image was stored as digital data. For a digital camera, this is the same as the Date and Time of Original. For a scanned image, this is the date and time it was scanned. format is "YYYY:MM:DD HH:MM:SS" with time shown in 24-hour format, and the date and time separated by one blank character.

			(*Exif 2.2 field name:* DateTimeDigitized)
=> => => FNumber	O	NR	The lens f-number (ratio of lens aperture to focal length) used when the image was captured. (*Exif 2.2 field name:* FNumber)
=> => => Exposure_Time	O	NR	The exposure time used when the image was captured, recorded in seconds. (*Exif 2.2 field name:* ExposureTime)
=> => => Exposure_Bias	O	NR	The actual exposure bias (the amount of under or over-exposure relative to a normal exposure, as determined by the camera's exposure system) used when capturing the image, using APEX units. (*Exif 2.2 field name:* ExposureBiasValue)
=> => => Subject_Distance	O	NR	The distance, in meters, between the frontal plane of the camera lens and the subject on which the camera was focused. (*Exif 2.2 field name:* SubjectDistance)
=> => => Metering_Mode	O	NR	The metering mode (the camera's method of spatially weighting the scene luminance values to determine the sensor exposure) used when capturing the image. (*Exif 2.2 field name:* MeteringMode)
=> => => ISO_Speed	O	NR	The ISO Speed and ISO Latitude of the camera or input device as specified in ISO 12232. (*Exif 2.2 field name:* ISOSpeedRatings)
=> => => Focal_Length	O	NR	The lens focal length in meters used to capture the image. (*Exif 2.2 field name:* FocalLength)
=> => => Flash	O	NR	Specifies whether a flash was used in image capture. (*Exif 2.2 field name:* Flash)
=> => => Orientation	O	NR	The orientation of the image, with respect to the placement of its rows as it was saved to disk, e.g. normal, rotated 90 degrees CCW. (*Exif 2.2 field name:* Orientation)
=> => => Compressed_Bits_per_Pixel	O	NR	Information specific to compressed data. The compression mode used for a compressed image is indicated in unit bits per pixel. (*Exif 2.2 field name:* CompressedBitsPerPixel)
=> => => Shutter_Speed	O	NR	The shutter speed. (*Exif 2.2 field name:* ShutterSpeedValue)
=> => => Aperture_Value	O	NR	The lens aperture. (*Exif 2.2 field name:* ApertureValue)
=> => => EXIF_Version	O	NR	Exif specification version, usually 1.0, 2.1 or 2.2. (*Exif 2.2 field name:* ExifVersion)
=> => GPS_Capture (c)	O	NR	Detailed technical metadata about the GPS and parameters used to capture the image.
=> => => GPS_Version_ID	O	NR	The version of the GPS Intermediate Driver. (*Exif 2.2 field name:* GPSVersionID)

=> => => **GPS_Longitude**	O	NR	The longitude in degrees of photographer's position. Positive numbers indicate east longitude. (*Exif 2.2 field name:* GPSLongitude)
=> => => **GPS_Latitude**	O	NR	The latitude in degrees of photographer's position. Positive numbers indicate north latitude. (*Exif 2.2 field name:* GPSLatitude)
=> => => **GPS_Altitude**	O	NR	The altitude, in meters, with respect to sea level of photographer's position. (*Exif 2.2 field name:* GPSAltitude)
=> => => **GPS_Destination_Latitude**	O	NR	The latitude in degrees of object being photographed. Positive numbers indicate north latitude. (*Exif 2.2 field name:* GPSDestLatitude)
=> => => **GPS_Destination_Longitude**	O	NR	The longitude in degrees of object being photographed. Positive numbers indicate east longitude. (*Exif 2.2 field name:* GPSDestLongitude)
=> => => **GPS_Destination_Bearing**	O	NR	The heading in degrees. A heading of zero is true north. (*Exif 2.2 field name:* GPSDestBearing)
=> => => **GPS_Destination_Distance**	O	NR	The distance from photographer to object being photographed. (*Exif 2.2 field name:* GPSDestDistance)
=> => => **GPS_Map_Datum**	O	NR	The geodetic survey data used by the GPS receiver. (*Exif 2.2 field name:* GPSMapDatum)
=> => => **GPS_Image_Direction**	O	NR	The direction the photographer is facing when the picture is taken, e.g. N, S, E, W. (*Exif 2.2 field name:* GPSImgDirection)
=> => => **GPS_Date_Stamp**	O	NR	Indicates the date. (*Exif 2.2 field name:* GPSDateStamp)
=> => => **GPS_Time_Stamp**	O	NR	Indicates the time as UTC(Coordinated Universal Time). TimeStamp is expressed as three RATIONAL values giving the hour, minute, and second. (*Exif 2.2 field name:* GPSTimeStamp)
=> => => **GPS_UTM_East**	O	NR	The Universal Transverse Mercator east coordinate. (*Exif 2.2 field name: N/A*)
=> => => **GPS_UTM_North**	O	NR	The Universal Transverse Mercator north coordinate. (*Exif 2.2 field name: N/A*)
=> => => **GPS_UTMZone**	O	NR	The Universal Transverse Mercator zone. (*Exif 2.2 field name: N/A*)
=> => => **GPS_DOP**	O	NR	The GPS DOP (data degree of precision). An HDOP value is written during two-dimensional measurement and PDOP during three-dimensional measurement. (*Exif 2.2 field name:* GPSDOP)
=> => => **GPS_Fix_Type**	O	NR	The type of GPS fix, either 2-D (only latitude and longitude, from three satellites), or 3-D (latitude, longitude, and altitude, from four or more

			satellites). (*Exif 2.2 field name: N/A*)
=> **Modified_Image_Technical_ Information** (c)	O	R	Technical metadata about a modified or processed image. The modified image is the result of the primary/original image having the format, size or resolution changed in order to improve delivery of the image over the Web.
=> => **Image_Data** (c)	O	NR	Detailed technical metadata about an image.
=> => => **File_Name**	MA	NR	The file name of the image including extension.
=> => => **File_Location**	MA	NR	The drive and folder path indicating where the file is stored on a server, or other storage system. This may also be a unique identifier if a storage system uses this instead of folders for storage.
=> => => **File_Type**	O		The file format of the modified image file which is usually the copy that gets served. Commonly used formats for digital photographs are: TIFF, JPEG.
=> => => **File_Size**	O	NR	The size in bytes of the image file. This is not condensed to KB, MB or GB. Example a 7.28MB file would be written out as 728,860,431.
=> => => **Compression**	O	NR	The compression scheme used to store the image data. Common schemes used for digital photographs are: Uncompressed, CCIT Group 3 1D, CCITT Group 3 2D, CCITT Group 4, LZW, JPEG Baseline Sequential, JPEG2000 Lossy, JPEG2000 Lossless.
=> => => **Image_Width**	O	NR	The width of the digital image, i.e. horizontal or X dimension, in pixels.
=> => => **Image_Height**	O	NR	The height of the digital image, i.e. horizontal or X dimension, in pixels.
=> => => **Resolution_Unit**	O	NR	Unit of measure used for X and Y resolution, usually inches (e.g. 300 dots per inch).
=> => => **X_Resolution**	O	NR	The number of pixels per ResolutionUnit in the Image_Width direction.
=> => => **Y_Resolution**	O	NR	The number of pixels per ResolutionUnit in the Image_Length direction.
=> => => **Bitdepth**	O	NR	The number of colors possible with each pixel.
=> => => **Colorspace**	O	NR	The color model of the image data. Common models used for digital photographs include: RGB, SRGB, CMYK, YCbCr.
=> **Thumbnail_Information** (c)	O	R	Information about a thumbnail or browse graphic. A "browse graphic" is an FGDC CSDGM term for a graphic that provides an illustration of the data set. The graphic should include a legend for interpreting the graphic.
=> => **Image_Data** (c)	O	NR	
=> => => **Thumbnail_File_Name**	MA	NR	The file name including the file extension, e.g.

			*.jpg.
=> => => **Thumbnail _File_Type**	O	NR	The file format of the thumbnail or browse graphic, usually JPEG.
=> => => **Thumbnail _File_ Description**	O	NR	A text description of the thumbnail or browse graphic.
=> **Change_History**	O	R	Information about changes or modifications to the image.
=> => **Date_Processed**	O	NR	The Date or DateTime image was processed or edited.
=> => **Processing_Agency**	O	NR	The organization-level producer(s) of the processed image.
=> => **Processing_Rationale**	O	NR	The rationale for image editing decisions or describes the trigger event for image migration.
=> => **Processing_Actions**	O	NR	An ordinal listing of the image processing steps performed.
=> => **Processing_Software**	O	NR	The name of the image processing software used to edit or transform the image Data, e.g. Adobe Photoshop.

Local Extension Information

The fourth of four top level sections of the NPS Digital Photo Metadata Standard. Local_Extension_Information provides a place to add metadata elements that have been used for a single system or NPS profile and are unlikely to have universal applicability across multiple systems.

The only child element called Local_Profile_Name should always be included and should be repeated for each new Local_Profile_Name (e.g. NPS Focus, IPTC data, Data Store, etc.). The child elements under Local_Profile_Name will generally be unique for each cluster.

A new production rule called "Extends the Element" is included in this section to indicate when the Local_Extension element should be integrated into one of the first three sections of the Digital Photo Metadata Standard.

The generic element Local_Profile_Name is followed below by an actual example taken from the NPS Focus Digital Library.

Element Name	M/O	Rep	Definition
Local_Profile_Name	MA	R	The name of the system that provided the custom metadata elements below.
NPS Focus Digital Library *[sample content of Local_Profile_Name]*	MA	R	The name of the system that provided the custom metadata elements below.
RecordOwner	M	NR	Identifies who is authorized to create, edit, and delete records in a particular NPS Focus digital collection
=> MrSID	O	NR	**Extends the Element:** Technical_Information => Image_Information => Primary_Image_Technical_Information => Image_Data **Definition:** Cluster used to call an image encoded as MrSID from a LizardTech image server
=> => Server	MA	NR	The name of the server on which the image is stored, e.g. image1.nps.gov.
=> => Catalog	MA	NR	The name of the Catalog (top level folder) in which the image is stored.
=> => Folder	MA	NR	The name of the Folder in which the image is stored.
=> => File	MA	NR	The file name of the MrSID encoded image.